FORMING FERROELECTRIC $Pb(Zr,Ti)O_3$ FILMS

ABSTRACT

Improved methods of forming PZT thin films that are compatible with industry-standard chemical vapor deposition production techniques are described. These methods enable PZT thin films having thicknesses of 70 nm or less to be fabricated with high within-wafer uniformity, high throughput and at a relatively low deposition temperature. In one aspect, a source reagent solution comprising a mixture of a lead precursor, a titanium precursor and a zirconium precursor in a solvent medium is provided. The source reagent solution is vaporized to form a precursor vapor. The precursor vapor is introduced into a chemical vapor deposition chamber containing the substrate. In another aspect, before deposition, the substrate is preheated during a preheating period. After the preheating period, the substrate is disposed on a heated susceptor during a heating period, after which a PZT film is formed on the heated substrate.